

The effects of a 10-week plyometric training intervention on jump performance in professional ballet dancers

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Objectives: The aim of this study was to examine the effects of a 10-week plyometric intervention program on jump performance and lower-limb alignment of professional ballet dancers.

Method: Eleven (8 male, 3 female) professional ballet dancers were assigned to a 10-week plyometric intervention (IG), which consisted of a guided plyometric training session once a week. Six (3 male, 3 female) professional ballet dancers volunteered for the control group (CG) carrying out their normal daily routine. The following measures were taken pre- and post-intervention for all participants: Jump height, power, force, speed, contact time, reaction time and leg stiffness during counter movement jumps (CMJ), multiple counter movement jumps (MCMJ) as well as jump distance in a dance-adapted long jump (jeté). In addition, leg alignment during jumping was rated and assessed via the adapted landing error screening test (LESS).¹ As data was not normally distributed, Mann-Whitney-U and Wilcoxon tests were performed to check for significant differences between groups and between pre- and post-test measurements respectively.

Main findings: After 10 weeks, no significant differences were observed between the intervention and control groups in all above described parameters (all p-values >0.05). However, significant improvements were found in jump height (p=0.013), speed (p=0.041), contact time (p=0.021), leg stiffness (p=0.008) and jeté (p=0.008) from pre-to posttest in the intervention group. Also in the LESS-test the intervention group displayed significant improvements from pre-to posttest in the CMJ in sagittal (p=0.014) and frontal plane (p=0.025, p=0.016).

Discussion/Conclusions: Although current quantitative results show no significant differences between the groups for CMJ and MCMJ, some p-values close to 0.05 and significant differences in the intervention group from pre-to post tests may indicate that plyometric training has promising benefits to improve jumping height and jumping distance of professional ballet dancers. Results of the movement screening suggest that plyometric training influences lower limb alignment proposing the integration of such training for injury prevention. Reasons for the non-significant quantitative differences might be the small sample size, the timing of the post-tests during an extremely exhausting fortnight of rehearsals and the low frequency (once a week) of the intervention program.

References:

1. Padua DA, Di Stefano LJ, Beutler AI, De la Motte, SJ, Di Stefano MJ, & Marshall SW. (2015). The Landing Error Scoring System as a Screening Tool for an Anterior Cruciate Ligament Injury–Prevention Program in Elite-Youth Soccer Athletes. *Journal of Athletic Training*. 2015; 50(6):589–595.